CLASSIFICATION S-E-C-R-E-T [redacted]

CENTRAL INTELLIGENCE AGENCY

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SUBJECT	Scientific - Chemistry, liquid oxygen		
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DATE PUBLISHED	1944 - 1949	SUPPLEMENT TO REPORT NO.	
LANGUAGE	Russian		

THIS IS UNEVALUATED INFORMATION

25X1 [redacted]

PRODUCTION OF LIQUID OXYGEN IN THE USSR

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It is stated that in 1938 the USSR occupied the first place in Europe as a producer of oxygen and that the rate of development of this industry was such that this country was rapidly moving up to the first place in the world (see "Oxygen in Metallurgy," [redacted] "Equipment for Liquid Oxygen Production Used in the USSR," [redacted] which is based on a book by S. Ya. Gersh (1), lists the types and capacities of the latest equipment for the production of liquid oxygen used in the USSR as of 1949. Capacities corresponding to an output of 30, 130, 250, 300, 1,000, and 3,500 cubic meters of oxygen and 1,000 kg of liquid oxygen per hour per individual machine are mentioned. This equipment is distributed by Glavkislorod (Main Oxygen Administration). Work on the development of some of the latest types of equipment was done by VNIIKIMASh (All-Union Scientific Research Institute of Oxygen Machine Building).

It is not known at what plants the equipment described in Gersh's book has been installed, but Gersh's statement that transportation of liquid oxygen is expensive and that it should not be transported over too great a distance (i.e., that it should be produced near the place where it is used or consumed) seems to be significant in that connection (1). While local production of liquid oxygen is regarded as the most desirable practice and for that reason is probably carried out wherever possible, the transportation of this product over long distances nevertheless takes place in the USSR. According to Gersh, tanks having a capacity of 12.75 tons of liquid oxygen are used for the transportation of this product by rail and can also be used for storage at stationary installations. When transported by rail, these tanks are fastened by means of chains to ordinary flat cars. The first experimental shipment of oxygen in a railroad tank was carried out in 1946. Tanks of this type are now being regularly refilled at large oxygen plants. They have cylindrically shaped inner surface with round ends (and therefore appear elongated) and are referred to in the Russian text as "cisterns." Stationary tanks for liquid oxygen with a spherical inner surface are used. These tanks have the following capacities in kilograms of oxygen: 1,120, 1,465, 2,250, 3,380, 4,500, 9,030, and 13,600. In addition to the 12.75-ton tank described above, there are

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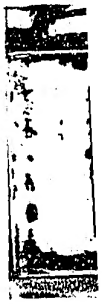

smaller tanks for transportation by motor truck. These tanks have the following capacities in kilograms of oxygen: 733, 1,465, 2,965, and 3,380. Oxygen is also supplied in ordinary small cylinders, which according to USSR practice are painted light blue when they contain oxygen (there is a standard color for each kind of gas). Users who require gaseous oxygen obtain it by evaporating liquid oxygen by means of so-called gasifiers into which the liquid is transferred from stationary or movable tanks. There are heated gasifiers for small quantities and cold gasifiers for developing large quantities of oxygen gas. The cold gasifiers can also be used for storing liquid oxygen and have the following capacities in kilograms of liquid oxygen: 136, 271, 556, 1,080, and 2,195. Hot gasifiers mounted on motor trucks are available for small users who do not have their own equipment for evaporating the oxygen.(2)

25X1 The following industrial applications involving the use of oxygen have been initiated, investigated, or developed wholly or in part and introduced into industrial practice in the USSR: 25X1 [redacted] use in blast furnaces and open hearth furnaces utilization in such branches of industry as production of nitric acid, sulphuric acid, calcined soda, and calcium carbide (3); and gasification of solid fuels 25X1 [redacted] The use of oxygen permits raising the efficiency of ordinary sulphuric acid contact plant equipment by a factor of 5-6.(4)

[redacted]

1. S. Ya. Gersh, Glubokoye Okhlazhdeniye (Cooling to Extremely Low Temperatures), Vol II, 2d edition, Moscow, 1949, p 303

2. Ibid., pp 310-323

3. A. G. Kasatkin, Kislorod, No 4, 1944, pp 1-10

4. G. K. Boreskov, Kislorod, No 4, 1944, pp 16-27; cf. Chemical Abstracts, Vol XXXIX, 1025 1.

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